Inclusive and sustainable industrial development platform/SDG9 indicators: challenges in aggregating economic, environmental and social indicators into synthetic indices.

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Structure of the presentation

- 1. The importance of the inclusive and sustainable industrial development (ISID) concept for UNIDO.
- 2. ISID indicators: scoreboard approach
- 3. Aggregating ISID indicators: the problem of composite indices
- 4. Experimenting new ISID indices

1. The importance of the inclusive and sustainable industrial development (ISID) concept for UNIDO.

The UNIDO concept of inclusive and sustainable industrial development (ISID)

ISID "enhances and reinforces economic growth and diversification in a socially inclusive and environmentally sustainable manner, guided by four overarching principles:

- **No one is left behind** in benefiting from industrial growth and **prosperity is shared among all parts** of the society as industry creates the wealth needed to address critical social and humanitarian needs;
- **Every country is able to achieve a higher level of industrialization** in their economies, and benefits from the globalization of markets for industrial goods and services;
- Broader economic and social progress is supported **within an environmentally sustainable** framework";

Source: https://isid.unido.org/

ISID is reflected in to the Sustainable Development Goal 9

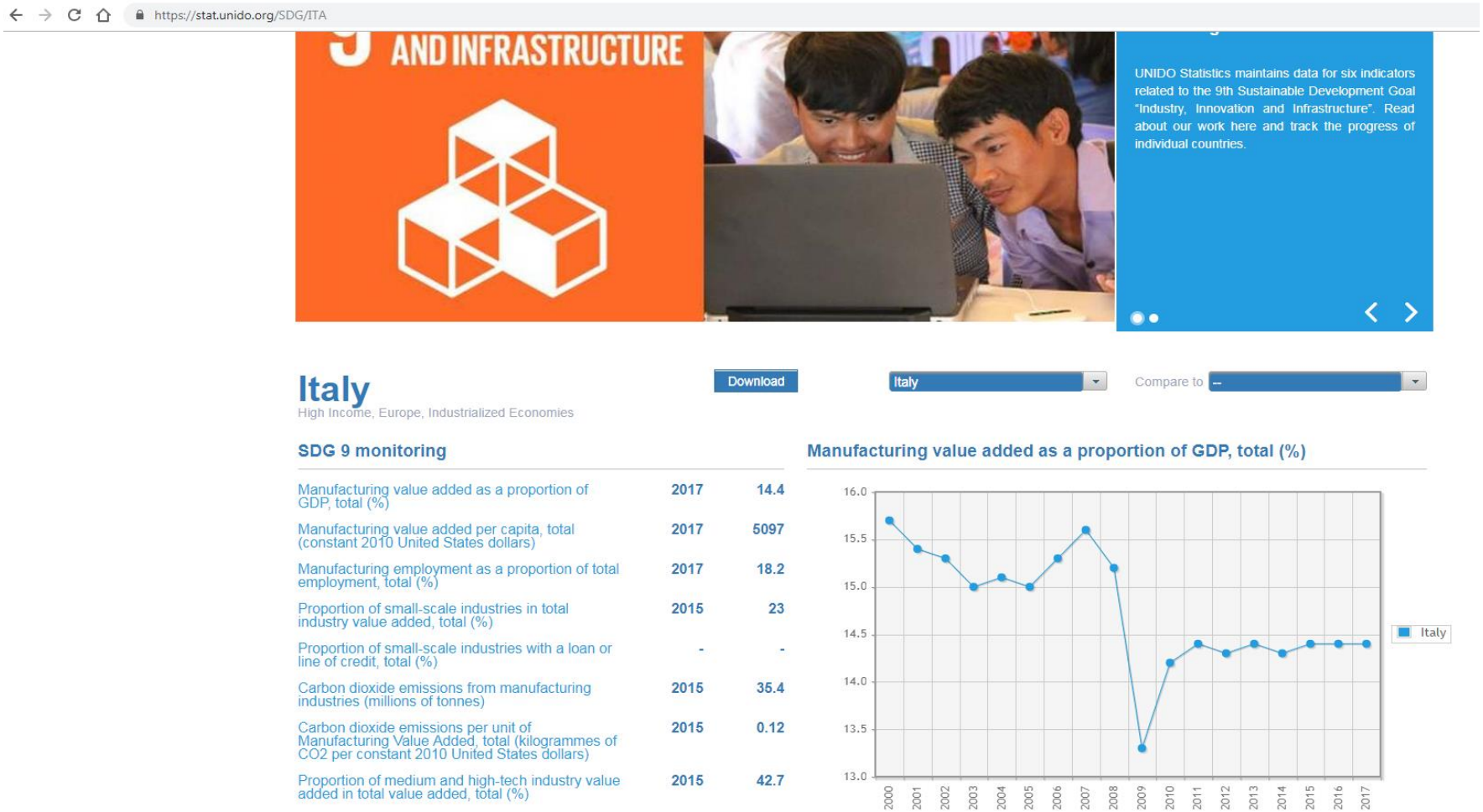
2. ISID indicators: scoreboard approach

Inter-Agency and Expert Group on Sustainable Development Goal Indicators

Goal 9. Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation

9.1 Develop quality, reliable, sustainable and resilient infrastructure, including regional and trans-border infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all	9.1.1 Share of the rural population who live within 2 km of an all-season road 9.1.2 Passenger and freight volumes, by mode of transport
9.2 Promote inclusive and sustainable industrialization and, by 2030, significantly raise industry's share of employment and gross domestic product, in line with national circumstances, and double its share in least developed countries	9.2.1 Manufacturing value added as a percentage of GDP and per capita 9.2.2 Manufacturing employment as a percentage of total employment
9.3 Increase the access of small-scale industrial and other enterprises, in particular in developing countries, to financial services, including affordable credit, and their integration into value chains and markets	9.3.1 Percentage share of small-scale industries in total industry value added 9.3.2 Percentage of small-scale industries with a loan or line of credit
9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities	9.4.1 CO_2 emission per unit of value added
9.5 Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending	9.5.1 Research and development expenditure as a percentage of GDP 9.5.2 Researchers (in full-time equivalent) per million inhabitants
9.a Facilitate sustainable and resilient infrastructure development in developing countries through enhanced financial, technological and technical support to African countries, least developed countries, landlocked developing countries and small island developing States	9.a.1 Total official international support (official development assistance plus other official flows) to infrastructure
9.b Support domestic technology development, research and innovation in developing countries, including by ensuring a conducive policy environment for, inter alia, industrial diversification and value addition to commodities	9.b.1 Percentage of medium and high-tech industry value added in total value added

How to measure and how to set SDG 9 targets?

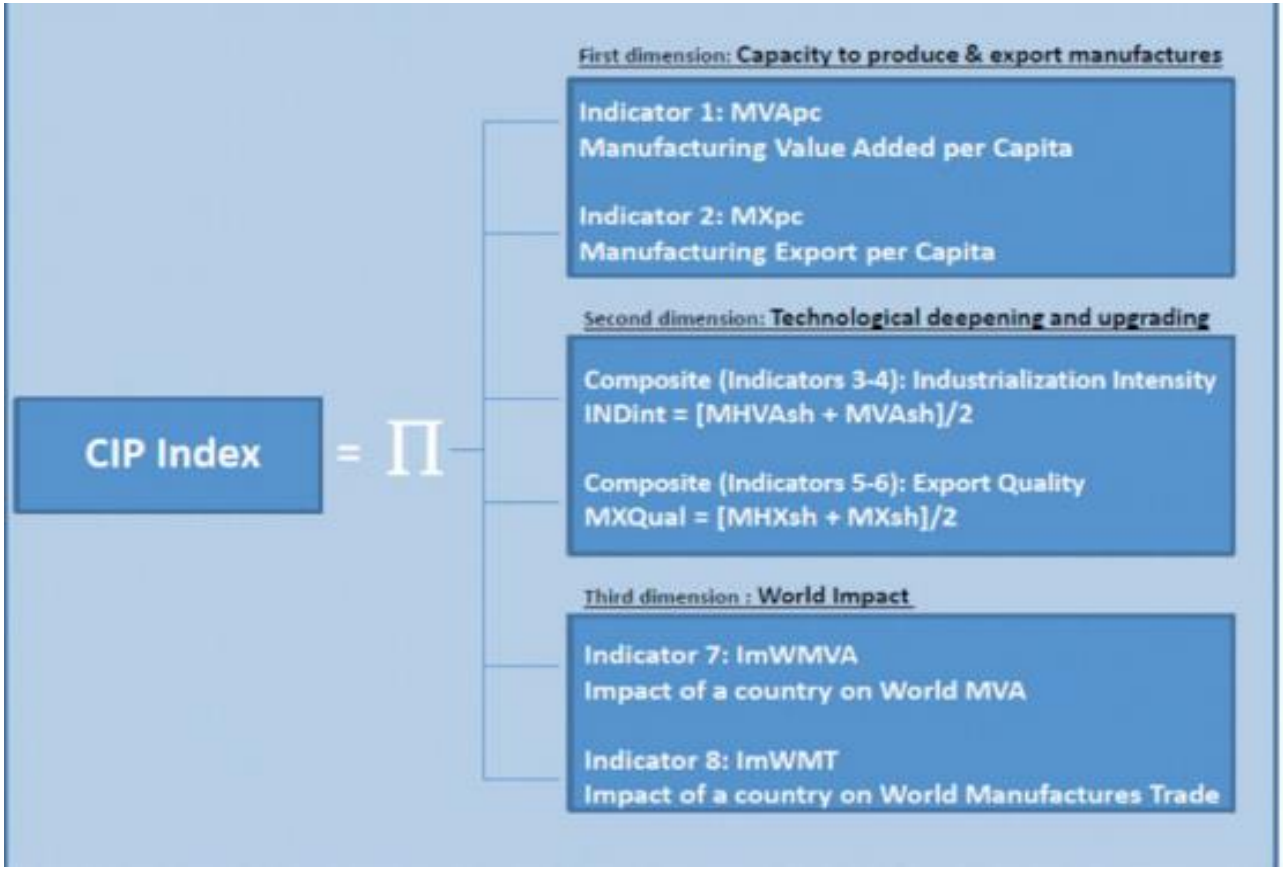


3. Aggregating ISID indicators: the problem of composite indices

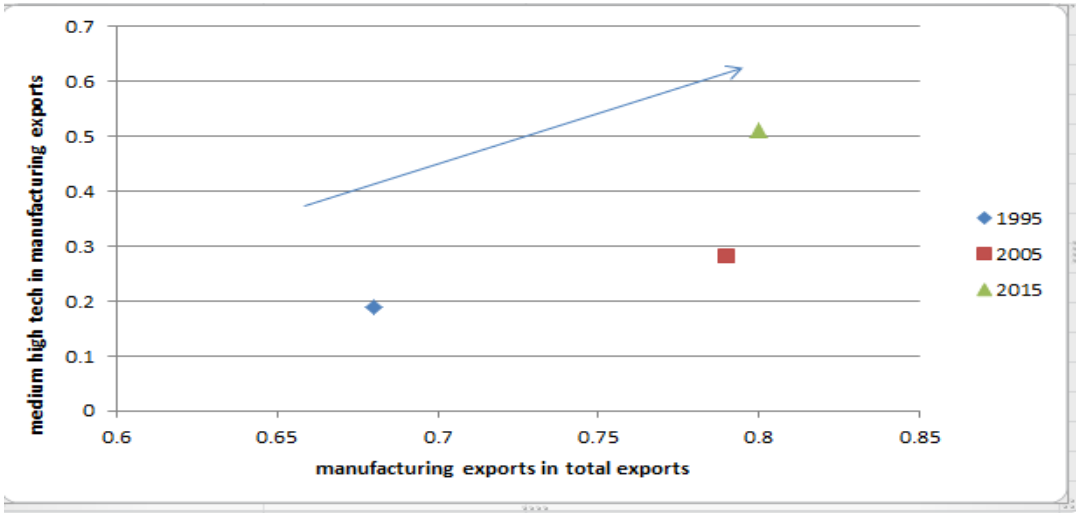
The need of ISID composite indices

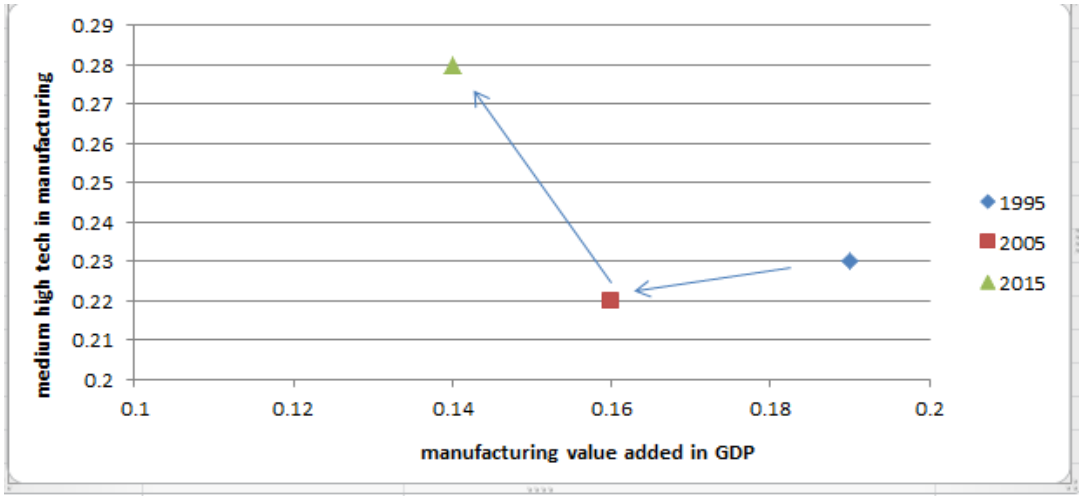
How to measure trade offs? How to evaluate if negative impacts of ISID indicators are compensated by positive impacts?

The UNIDO Competitive Industrial Performance Index



Monitoring industrial performance. The Morocco case

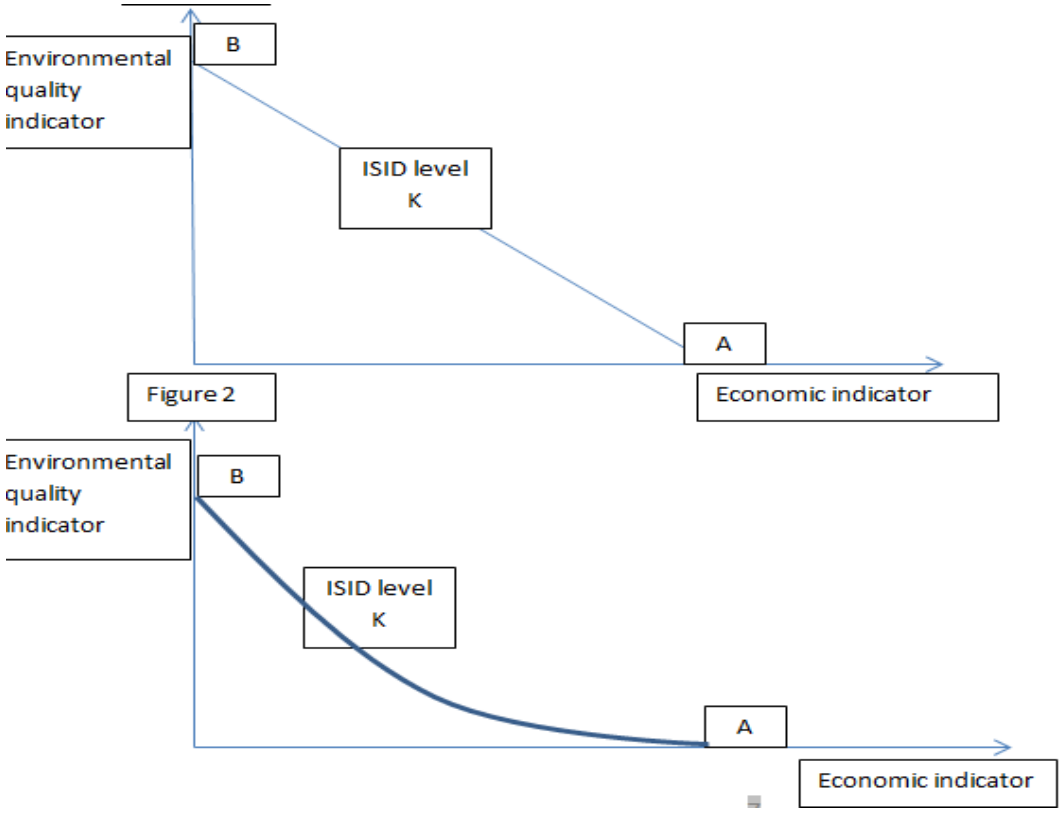




Ideally an ISID index..

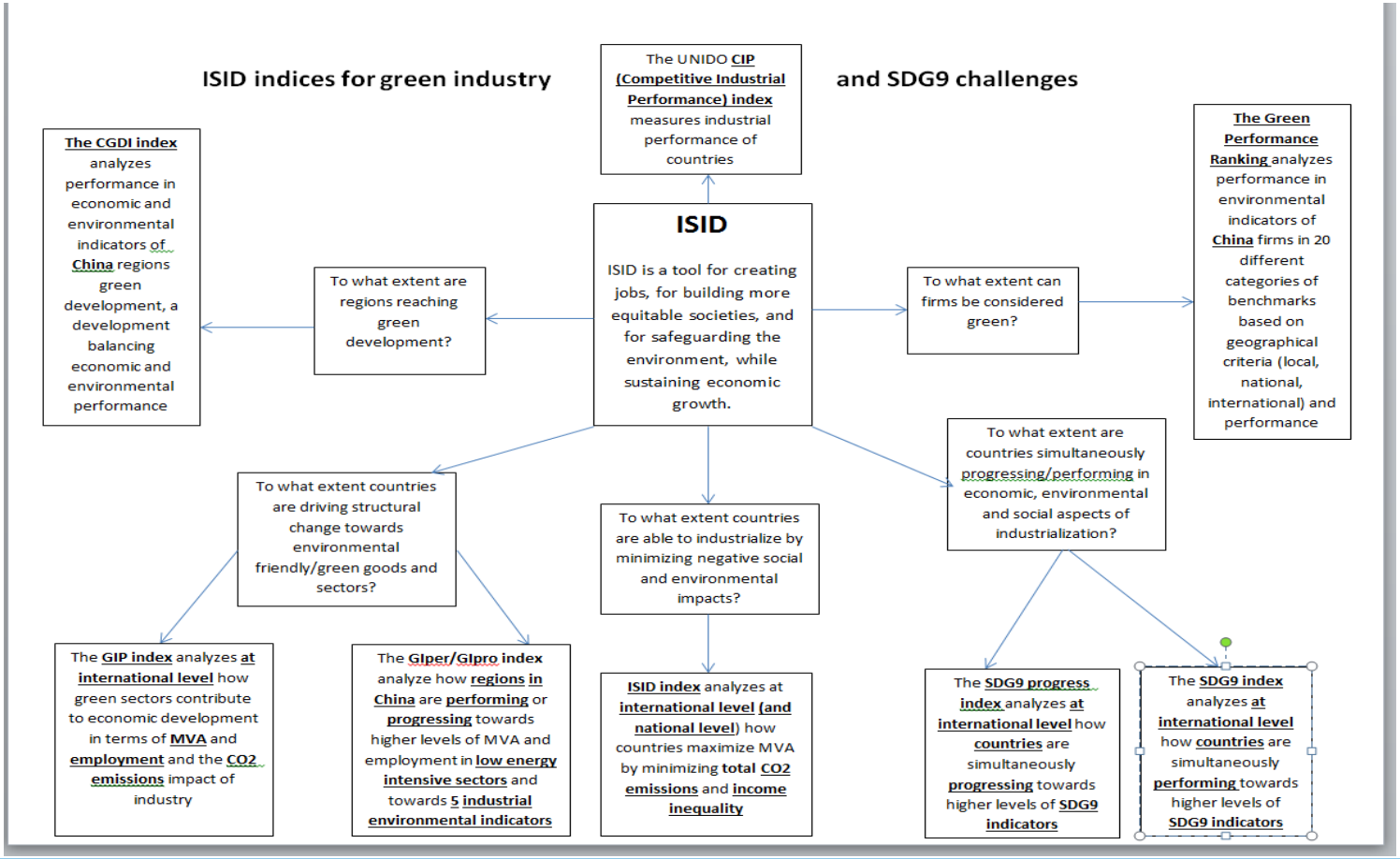
- 1) An ISID index is based on a solid definition/idea. Not well defined ideas are often not reflected into a well-defined index;
- 2) An ISID index includes at least an economic indicator, an environmental indicator and a social indicator to represent the three dimensions of sustainability;
- 3) The ISID index should be designed in such a way that increases in each single dimension of sustainability are reflected into an increase of ISID;
- **4) If possible, and without compromising the cost effectiveness of the ISID index creation and monitoring, the equal weight bias and the perfect substitutability bias should be dealt with.**
- 5) Data coverage should include OECD and non OECD countries across over time and when feasible, data should allow comparisons vis a vis the best international standards, even when the index is based on simple regions of a country. Detailed sectorial aggregation of industry could also be a desirable to qualify the different typologies of industrialization.

Mitigating the equal weights and perfect substitutability bias



4. Experimenting new ISID indices

A starting path: the UNIDO platform of ISID and green industry composite indices



The Data Envelopment Analysis approach

- **How can DEA be a desirable approach?**
  - It yields most favorable, country-specific weights, it may help to mitigate arbitrary/equal weight and perfect substitutability bias
  - It upholds the objectivity of policy benchmarking and prescription
- **What is DEA exactly? DEA in a nutshell**
  - An algorithm minimizing "bad" to achieve the same level of "good"
    - What is "bad"? CO2 emission and income inequality
    - What is "good"? Manufacturing performance
    - This "inputs orientation" approach is based on a set of country specific constraints

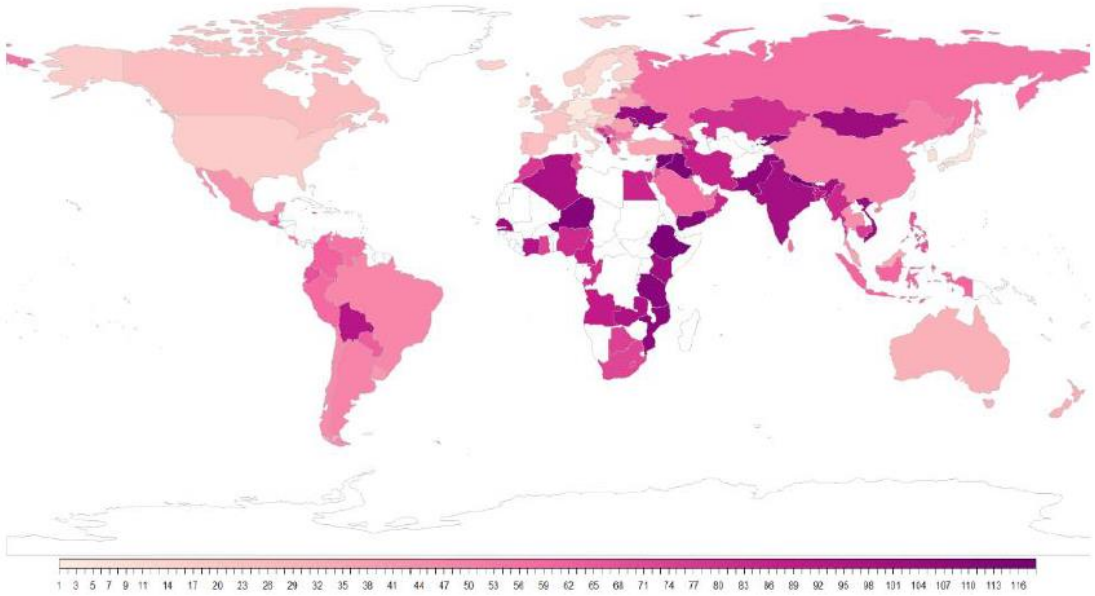
Two formulations of an ISID index

Dimensions	ISID best possible measurement	Official SDG 9 measurement
Manufacturing performance	Manufacturing value added per capita (US$)	Manufacturing value added per capita (US$)
Social inclusiveness	GINI inequality ratio (net, disposable income)	Manufacturing employment gap [Manufacturing share (sample max) - Manufacturing share]
Environmental sustainability	CO2 emission (kt) per capita	Manufacturing CO2 intensity (CO2, kg / MVA US$ 2010 constant)

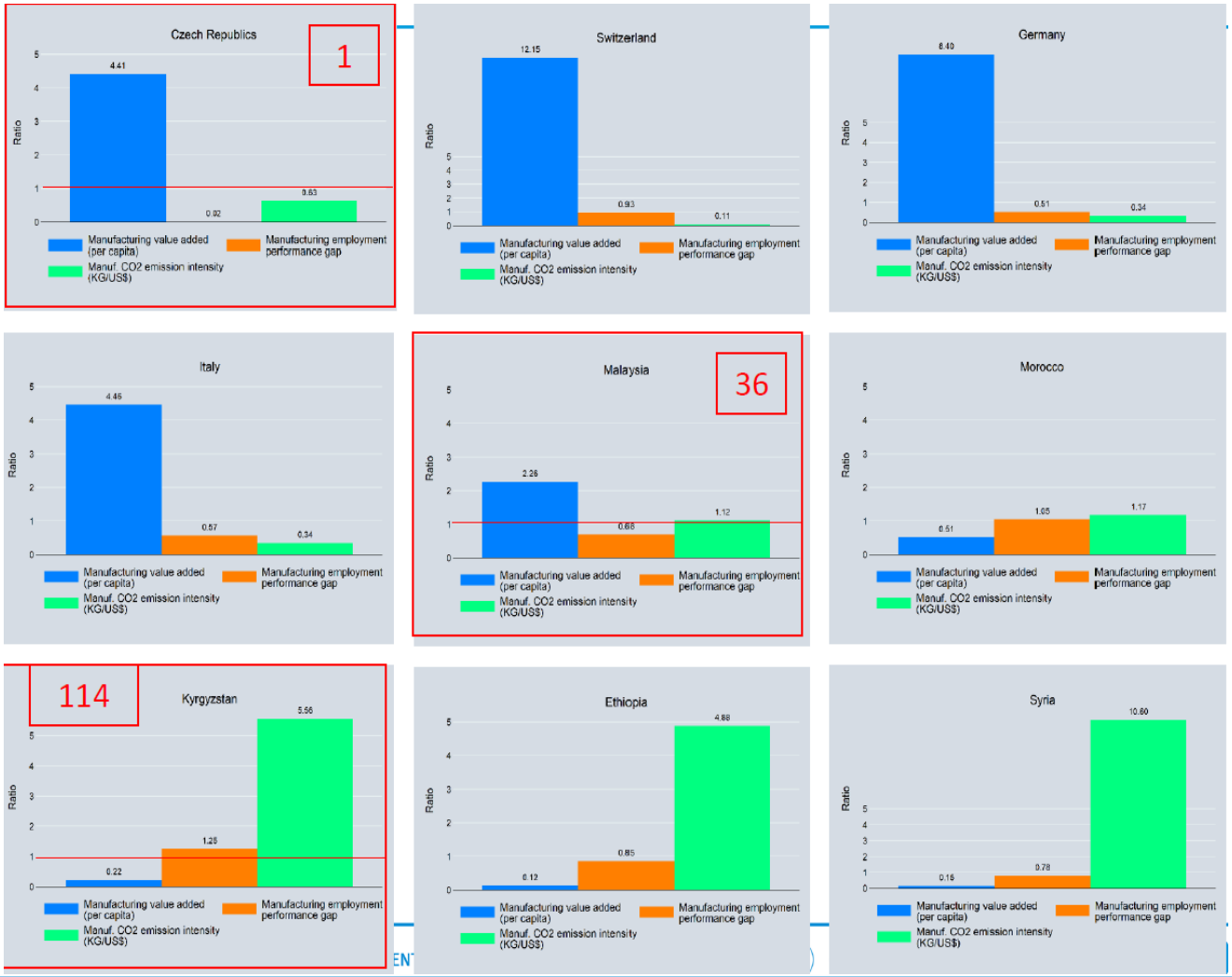
The SDG9 index ranking

SDG 9 2015	SDG 9 2015	SDG 9 2015
Czech Republic, Switzerland – 1	Republic of Korea – 8	Kyrgyzstan – 114
Germany – 3	Italy – 12	Iraq – 115
Japan – 4	Malaysia – 36	Ethiopia – 116
Ireland – 5	China – 51	Nepal – 117
Austria – 6	Morocco – 77	Syria – 118

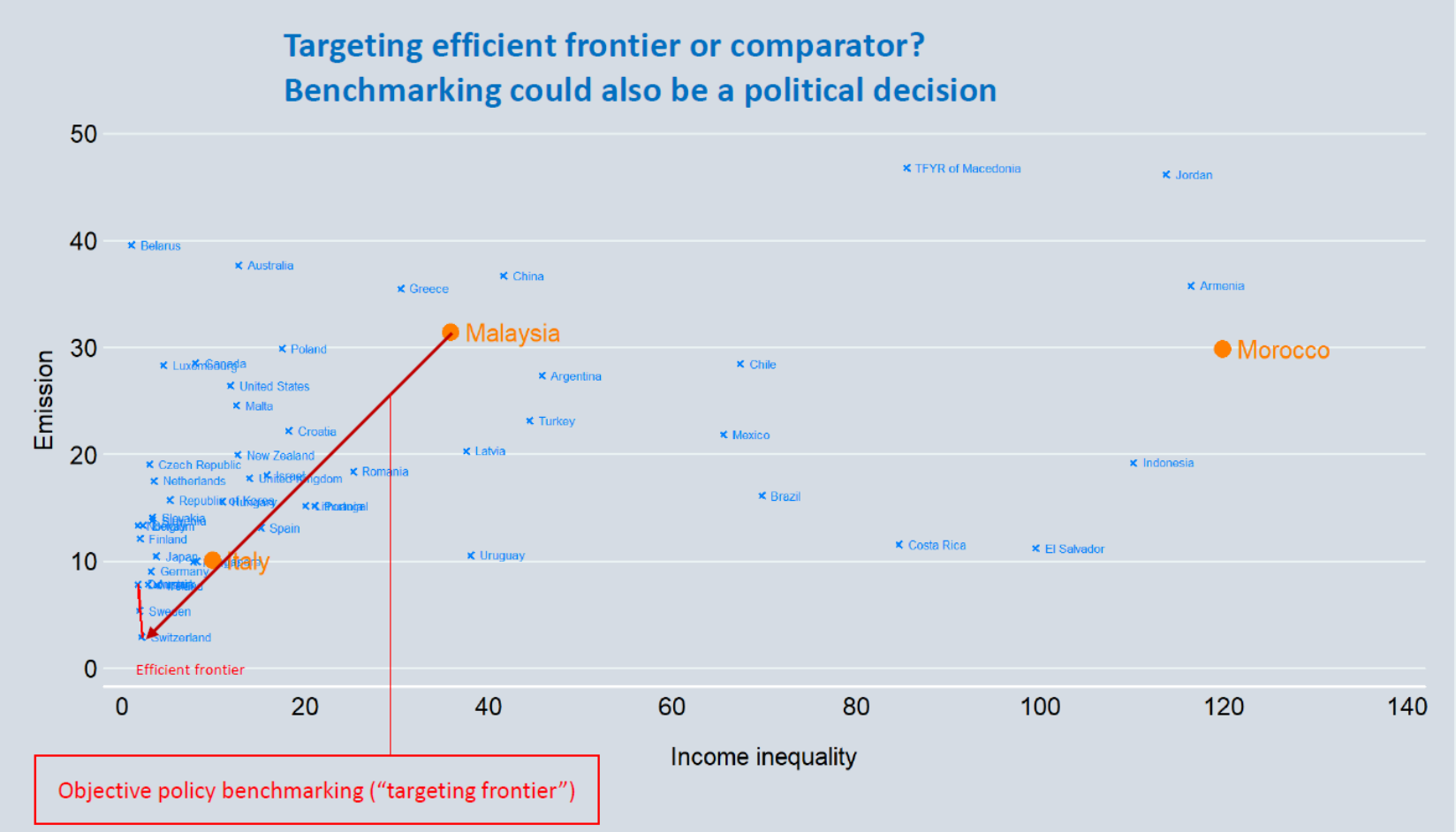
Sustainable Development Goal 9 ranking in 2015: The DEA approach



Explaining the ISID SD9 index



Policy implications from an ISID index approach



Thanks!